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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/616,314	07/17/2000	Mikio Kuwahara	NIT-209	7237

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ALEXANDRIA, VA 22314

EXAMINER

MOORE, JAMES K

ART UNIT	PAPER NUMBER
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2686

DATE MAILED: 05/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/616,314

Applicant(s)

KUWAHARA ET AL.

Examiner

James K Moore

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-5,9-12 and 15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2,9 and 15 is/are rejected.
- 7) ☒ Claim(s) 3-5 and 10-12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 April 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>14</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. The applicant's argument that Bruckert does not disclose or suggest that the stored samples are overwritten, see page 9 of the amendment, filed March 16, 2004, with respect to the rejection(s) of claim(s) 2, 9 and 15 under Bruckert are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Bruckert in view of Fukasawa.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. Claims 2, 9 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bruckert et al. (U.S. Patent No. 6,226,317) in view of Fukasawa et al. (U.S. Patent No. 5,463,660).

Regarding claim 2, Bruckert discloses a wireless positioning method for estimating a position of a terminal by using reception timings of signals transmitted from first and second base stations (12, 14) in a cellular communication system. The method comprises a first step of measuring a reception timing of a received signal from the first base station having a power higher than that of a received signal from a second base station. See col. 2, line 59 through col. 3, line 10). The method also comprises a second step of canceling the received signal from the first base station from stored

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received signals. See col. 5, lines 50-63. The method also comprises a third step of measuring a reception timing of the received signal from the second base station extracted from the stored received signals after the second step. See col. 5, line 64 through col. 6, line 10. The second step comprises a fourth step of storing the received signals from the first and second base stations into a storing circuit in the terminal. See col. 5, lines 21-49. The method also comprises a fifth step of forming a replica of the received signal of the first base station from the stored signals, and a sixth step of subtracting the replica from the stored signals. See col. 5, line 50 through col. 6, line 20. Bruckert does not disclose that the sixth step comprises overwriting the signals stored in the storing circuit with a result of the subtraction step.

However, Fukasawa also discloses a method of canceling a received signal from a base station from stored received signals. Fukasawa's method comprises storing received signals from first and second base stations into a storing circuit (shift register 6) in a terminal. See Figure 1, col. 3, lines 21-31 and 51-63. The method also comprises forming a replica of the received signal of the first base station from the stored signals. See col. 5, line 62 through col. 6, line 3. The method also comprises subtracting the replica from the stored signals and overwriting the signals stored in the storing circuit with a result of the subtraction step. See col. 6, lines 4-9. One of the features that distinguishes Fukasawa from other prior art methods of iterative interference cancellation is the use of a single memory (shift register 6) which is overwritten multiple times, rather than using multiple memory units to iteratively cancel interference. See e.g., the multiple delay mechanisms (526,536,546) in Figure 6 of

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Stilwell et al. (U.S. Patent No. 5,235,612), cited by Bruckert as a prior art beacon cancellation engine (see col. 5, lines 50-58 of Bruckert). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Bruckert with Fukasawa, such that the sixth step comprises overwriting the signals stored in the storing circuit with a result of the subtraction step, in order to minimize the amount of memory required to perform the interference cancellation.

Regarding claim 9, Bruckert discloses a wireless positioning apparatus (mobile subscriber unit 18). The apparatus comprises a signal processor (beacon cancellation engine 58) for canceling a received signal from a first base station whose reception power is higher than that of a received signal from a second base station in a cellular communication system. See col. 5, lines 21-63. It is also inherent that the apparatus comprises a CPU for processing an output signal of the signal processor (determining location based on TOA measurements). See col. 5, line 64 through col. 6, line 10. The apparatus also comprises a storing circuit (beacon signal sample and store stage 56) for storing the received signal from the first and second base stations, and a timing measurement circuit (TOA determinator 60) for measuring reception timings of the signals received from the first and second base stations based on signals stored in the storing circuit. See col. 5, lines 21-49. The signal processor has a replica signal generating circuit for generating a replica of the received signal of the first base station from the signals stored in the storing circuit and a subtraction circuit for subtracting the replica from the stored signals, and the timing measurement circuit measures the reception timing of the signal received from the second base station based on the result

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of the subtraction. See col. 5, line 50 through col. 6 line 10. Bruckert does not disclose that the stored signals are overwritten with a result of the subtraction.

However, Fukasawa also discloses a wireless apparatus for canceling a received signal from a base station from stored received signals. Fukasawa's apparatus comprises a storing circuit (shift register 6) for storing received signals from first and second base stations. See Figure 1, col. 3, lines 21-31 and 51-63. The apparatus also comprises a replica signal generating circuit (interference estimator 18) for generating a replica of the received signal of the first base station from the stored signals. See col. 5, line 62 through col. 6, line 3. The apparatus also comprises a subtraction circuit (interference subtractor 20) for subtracting the replica from the stored signals, wherein the stored signals are overwritten with a result of the subtraction. See col. 6, lines 4-9. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Bruckert with Fukasawa, such that the stored signals are overwritten with a result of the subtraction, in order to minimize the amount of memory required to perform the interference cancellation.

Regarding claim 15, Bruckert discloses a base station transmission timing measuring apparatus (mobile subscriber unit 18). The apparatus comprises a storing circuit (beacon signal sample and store stage 56) for storing received signals from a first and a second base station, a timing measuring circuit (TOA determinator 60) for measuring signal transmission timings of the first and second base stations from timings of signals received from the first and second base stations, and an interference canceling circuit (beacon cancellation engine 58) for canceling the received signal from

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the first base station whose reception power is higher than that of the received signal from the second base station. See col. 5, lines 21-63. The timing measuring circuit measures the signal transmission timing of the second base station based on signals which are a result of canceling. See col. 5, line 8 through col. 6, line 10. Bruckert does not disclose that the signals stored in the storing circuit are replaced by signals which are a result of canceling.

However, Fukasawa also discloses a wireless apparatus for canceling a received signal from a base station from stored received signals. Fukasawa's apparatus comprises a storing circuit (shift register 6) for storing received signals from first and second base stations. See Figure 1, col. 3, lines 21-31 and 51-63. The apparatus also comprises an interference canceling circuit (interference subtractor 20) for canceling the received signal from the first base station from the second base station. See col. 5, line 62 through col. 6, line 9. The signals stored in the storing circuit are replaced by signals which are a result of canceling. See col. 6, lines 4-9. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Bruckert with Fukasawa, such that the signals stored in the storing circuit are replaced by signals which are a result of canceling, in order to minimize the amount of memory required to perform the interference cancellation.

Allowable Subject Matter

4. Claims 3-5 and 10-12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ken Moore, whose telephone number is (703) 308-6042. The examiner can normally be reached on Monday-Friday from 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold, can be reached at (703) 305-4379.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).


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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Ken Moore

5/20/04

JKM


CHARLES APPIAH
PRIMARY EXAMINER